

DRYING RACK FOR A LAUNDRY DRYER

5 Cross-Reference to Related Application:

This application is a continuation of copending International Application No. PCT/EP02/00804, filed January 25, 2002, which designated the United States and was not published in English.

10 Background of the Invention:

Field of the Invention:

The invention relates to a drying rack on which items that are to be dried are disposed in a stationary manner within a rotatable drum of a laundry dryer with a filling opening,  
15 which opens out into the drum, and a door for closing the filling opening and a laundry dryer with such a drying rack.

It may be necessary for items for drying to be disposed in a stationary manner if they are not permitted to move during the  
20 drying operation. This may be the case, for example, with knitwear and woolens, which would shrink if they moved during drying. The same may apply to shoes or other items for drying that could be damaged by the movement in the drum.

25 Such a drying rack or such a dryer is known, for example, from German Published, Non-Prosecuted Patent Application DE 40 34

660 A1. This document describes a drying rack that is in the form of a laundry basket and is fastened, at the rear, on the mounting of the drum rear wall, and, at the front, on the dryer door. The laundry basket is in the form of a shell that is open at the top and is produced from a wire grille.

Comparable drying racks are known from German Published, Non-Prosecuted Patent Application DE 27 06 595, German Utility Model DE 85 05 995 U1, United States Patent Nos. 3,344,532 to Bigler, 3,316,659 to Lauck, and 4,591,548. All of the above-

mentioned documents, likewise, describe drying racks in the form of a shell that is open at the top. Drying racks so configured have, in particular, the disadvantage that the items for drying that are disposed therein project beyond the edge of the shell-like drying rack and may come into contact with the rotating drum. It is possible here for at least part of the item for drying to be moved and, as a result, to be damaged, which is precisely what is to be avoided by the stationary configuration. Moreover, it is also possible here for the drying rack to be carried along and to be damaged itself or to damage other parts of the dryer.

#### Summary of the Invention:

It is accordingly an object of the invention to provide a drying rack for a laundry dryer that overcomes the hereinafore-mentioned disadvantages of the heretofore-known

devices of this general type and that reliably avoids damage to the items for drying during the drying operation.

With the foregoing and other objects in view, in a laundry  
5 dryer having a rotatable drum with a filling opening and a door for closing the filling opening, there is provided, in accordance with the invention, a drying rack including an air-permeable self-supporting outer enclosure on which items to be dried are disposed in a stationary manner within the drum, the  
10 outer enclosure being in the form of a closed grille in a circumferential direction of the drum, and fastening devices for removably fastening the outer enclosure to the laundry dryer.

15 In accordance with another feature of the invention, the outer enclosure has an end side with an access opening closed by the door when the outer enclosure is inserted into the drum.

In accordance with a further feature of the invention, the  
20 outer enclosure has a rear side and a grille termination on the rear side.

In accordance with an added feature of the invention, the outer enclosure is a wire grille.

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The closed grille form of the drying rack prevents parts of the items for drying coming into contact with the drum, and also ensures that the quantity of items for drying and the extent to which the items are spread out are limited. The  
5 closed configuration, in addition, gives an operator a clear idea of the admissible quantity of items for drying.

This reliably avoids the situation where an excessively large quantity of items for drying is loaded onto the drying rack  
10 and parts of the items for drying can fall off the drying rack and get in between the drying rack and drum, and/or where parts of the items for drying come into contact with the moving drum and are damaged on account of the constant movement during the drying operation.

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The drying rack may include a grille structure that has a smaller mesh width in the bottom region than in the top region or in which a bottom grille part is spanned by bars. It is, thus, possible to avoid the situation where small items for  
20 drying fall through and, nevertheless, to increase the safety.

The outer enclosure is, advantageously, closed on all sides, with the exception of an access opening, which may be disposed behind the filling opening of the laundry dryer and closed, in  
25 particular, by the door of the latter. The drying rack may, for example, be in the form of a cylinder that is open on an

end side and can be inserted horizontally into the laundry dryer.

In accordance with an additional feature of the invention, an  
5 inner rack is disposed in the outer enclosure.

By an inner rack, which may be disposed within the outer enclosure, it is possible to increase to a considerable extent the surface area over which the items for drying can be spread  
10 out. It is, thus, possible to achieve the situation where the drying air can better reach the items for drying. The inner rack may have, in particular, planes that are disposed one above the other, the edge regions, in particular, being open for the most part. It is, thus, possible for relatively large  
15 items for drying to be distributed over a number of planes, by one part being disposed on one plane and the part that projects beyond the plane edge being folded over around the edge and being disposed on an adjacent plane. For example, it is, advantageously, possible for a pullover to be disposed on  
20 such an inner rack with three planes, in which case the chest region is disposed in the top plane, the sleeves can be folded over at the sides and disposed on the central plane, located beneath the top plane, and the trunk region of the pullover, which follows the chest region, is positioned in the same way  
25 in the lowermost plane. If the inner rack is configured as the separate part, it is possible for the operator, first of all,

to fasten the outer enclosure in the laundry dryer, then, to  
configure the items for drying on the inner rack, and,  
finally, to position the inner rack in the outer enclosure.

- 5 In accordance with yet another feature of the invention, the  
inner rack has at least two air-permeable planes disposed  
substantially parallel to one another.

The drying rack may always be configured such that the inner  
10 rack is kept at a distance from the base of the outer  
enclosure so, in addition to the planes of the inner rack, the  
base of the outer enclosure can be utilized for depositing  
items for drying.

- 15 Three fastening devices are, advantageously, provided for  
fastening the drying rack on the laundry dryer to prevent  
mechanical redundancy, it being possible for the three  
fastening devices to be provided, for example, at the bottom  
center and to the left and right of the filling opening of the  
20 laundry dryer.

In accordance with yet a further feature of the invention,  
there are provided connecting elements. The planes have  
corners, are connected to one another at the corners, and are  
25 kept at a distance apart from one another by the connecting  
elements.

In accordance with yet an added feature of the invention, the planes are fine-meshed and flexible plastic grilles each with an enclosing plastic frame.

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In accordance with again a further feature of the invention, the outer enclosure has at least two parts connected to one another in an articulated manner.

10 In accordance with again another feature of the invention, the two parts of the outer enclosure fully enclose the inner rack in an operational state.

In accordance with yet an additional feature of the invention,  
15 the inner rack is connected in an articulated manner to one of the two parts of the outer enclosure.

An articulated connection between the inner rack and outer enclosure, in addition, reduces the risk of the inner rack  
20 being lost. Even in the case of an articulated connection between the inner rack and outer enclosure, it is possible for the inner rack to be configured with a number of planes.

In accordance with again an added feature of the invention,  
25 the outer enclosure has at least two parts pivotably connected to one another.

In accordance with again an additional feature of the invention, the at least two parts enclose the inner rack in an operational state and the inner rack is pivotably connected to  
5 one of the at least two parts of the outer enclosure.

With the objects of the invention in view, there is also provided a drying rack, including an air-permeable self-supporting outer enclosure on which items to be dried are  
10 disposed in a stationary manner within a laundry drum of a laundry dryer, the outer enclosure being in the form of a closed grille in a circumferential direction of the drum and fastening devices for removably fastening the outer enclosure to the laundry dryer.

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With the objects of the invention in view, there is also provided a drying rack, including an air-permeable self-supporting outer enclosure on which items to be dried are disposed in a stationary manner within a laundry drum of a  
20 laundry dryer, the outer enclosure being in the form of a closed grille in a circumferential direction of the drum, an inner rack disposed in the outer enclosure and having at least two air-permeable planes disposed substantially parallel to one another, and fastening devices for removably fastening the  
25 outer enclosure to the laundry dryer.



With the objects of the invention in view, there is also provided a laundry dryer, including a rotatable drum having a front bearing plate with a filling opening, a door for closing the filling opening, dryer fastening devices, and a drying  
5 rack having an air-permeable self-supporting outer enclosure on which items to be dried are disposed in a stationary manner within the drum, the outer enclosure being in the form of a closed grille in a circumferential direction of the drum and rack fastening devices corresponding with the dryer fastening  
10 devices and removably fastening the outer enclosure to the dryer fastening devices.

Other features that are considered as characteristic for the invention are set forth in the appended claims.

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Although the invention is illustrated and described herein as embodied in a drying rack for a laundry dryer, it is, nevertheless, not intended to be limited to the details shown because various modifications and structural changes may be  
20 made therein without departing from the spirit of the invention and within the scope and range of equivalents of the claims.

The construction and method of operation of the invention,  
25 however, together with additional objects and advantages thereof, will be best understood from the following

description of specific embodiments when read in connection with the accompanying drawings.

Brief Description of the Drawings:

5 FIG. 1 is a cross-sectional view through a laundry dryer with a first embodiment of a drying rack according to the invention inserted therein;

FIG. 2 is a front elevational view of a second embodiment of  
10 the drying rack according to the invention;

FIG. 3 is a front elevational view of the drying rack of FIG. 2 in an open state;

15 FIG. 4 is a plan elevational view of a drying rack of the first embodiment according to the invention;

FIG. 5 is a front elevational view of the drying rack of FIG. 4; and

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FIG. 6 is a side elevation view of the drying rack of FIG. 4.

Description of the Preferred Embodiments:

Referring now to the figures of the drawings in detail and  
25 first, particularly to FIG. 1 thereof, there is shown a laundry dryer 2 having a drum 3 that can be rotated about a

horizontal axis and within which are fastened carry-along  
elements 4 for the laundry, these moving the laundry as the  
drum rotates. Also provided are a fan 14, a heater 15, and a  
condenser 13, to produce an air circuit, which is closed by  
5 the air channel 12, through the drum 3. In such a case, air  
heated by the heater 15 is directed from the rear, through the  
perforated base of the drum 3, into the drum 3, comes into  
contact there with the laundry that is to be dried and flows  
through the filling opening of the drum 3 to a lint filter 6  
10 within a dryer door 5, which closes the filling opening. The  
air stream is then deflected downwards in the dryer door 5 and  
directed by the air channel 12 to the condenser 13, in which  
moisture in the laundry that is absorbed by the air by cooling  
is condensed and discharged. Following the condenser 13, air  
15 is directed to the heater 15 again by the fan 14.

The drum 3 is mounted, at the rear, on the base by a rotary  
bearing and, at the front, by a bearing plate 7, the drum 3  
resting, by way of a flange, on a sliding strip 8 on the  
20 bearing plate 7 and, thus, being retained at the front end.

Furthermore, a drying rack 1 is disposed within the drum 3.  
This drying rack 1 includes an outer enclosure 10 and an inner  
rack 16 disposed within the outer enclosure 10. The outer  
25 enclosure 10 includes a cylindrical wire basket that is closed  
at a base. At its front open end, the outer enclosure 10 of

the drying rack 1 has fastening lugs 11 that can interact with corresponding fastening mount 9, which are formed within the bearing plate 7. By virtue of fastening the drying rack 1 exclusively on the bearing plate 7, it is possible for the  
5 drying rack 1 to be disposed, with particularly low outlay, in a stationary manner within the rotatable drum 3.

A first embodiment of the inner rack 16, which is only illustrated in part in FIG. 1, is, additionally, illustrated  
10 in FIGS. 4 to 6. The plan view of FIG. 4 shows two edge parts 17 that serve for connecting the planes disposed one above the other. The individual planes are formed by the plastic frame 18, in which a fine, air-permeable plastic netting 19 is braced. This may be achieved by positioning the plastic  
15 netting 19, during production of the frame 18, in the mold of the latter and being injection molded in the frame 18.

The front view, which is illustrated in FIG. 5, shows the fastening of the plastic frames 18 in the side parts 17. For  
20 such a purpose, the E-shaped side parts 17 have mounts into which the plastic frames 18 can be plugged and, if appropriate, latched.

This configuration, advantageously, means that only two types  
25 of part are necessary: the side part 17, on one hand, and, on

the other hand, the planes including the frame 18 and plastic netting 19.

FIG. 6 illustrates the inner rack 16 from the side, this illustrating, in particular, the lateral access openings 20 within the side parts 17, through which it is possible to reach between the planes from the side. As such, it is possible for an item to be dried that projects beyond a plane to be folded over around the edge both at the side and at the front and for the folded-over part to be disposed on an adjacent plane. For example, a pair of trousers can, thus, be positioned in an S-shaped manner in the inner rack. In the case of a pullover, it is possible, for example, for the chest region to be folded over onto the top plane, for the lower trunk region to be folded over in the front region and positioned on the bottom plane and for the sleeves to be positioned on the central plane from the side.

It is, nevertheless, possible to use the outer enclosure 10 without the inner rack 16 to dry, for example, shoes therein.

A second embodiment of the drying rack 1 is illustrated in FIGS. 2 and 3, in which the inner rack 16 is connected in an articulated manner to the outer enclosure 10, the outer enclosure 10 additionally including two swing-action parts. It is, thus, possible for the inner rack 16 to be fully enclosed

by the outer enclosure 10. As a result, the safety can be further increased. The outer enclosure 10 is in the form of a barrel and is separated, along the axis, into two parts, which are connected to one another in an articulated manner along a lateral line. On the side that is located opposite the articulation between the two enclosure parts, the inner rack 16 is articulated on one of the enclosure parts. In this exemplary embodiment too, the inner rack 16 has three planes, the top and the bottom planes being curved. In addition, it is also possible for items for drying to be deposited on the outer enclosure 10 on the inside, beneath the inner rack 16.

It is generally possible, in the case of an outer enclosure 10 made of parts that are connected to one another in an articulated manner, to provide that the enclosure 10 can be introduced into the dryer, and/or fastened within the drum, only when the parts have been swung together. Furthermore, for safety purposes, it may also be provided that the opening angle of the swing-action parts is limited. As a result, they reliably close again of their own accord without force being applied from the outside. It is, thus, possible to reduce the risk of the outer enclosure 10 accidentally swinging open during the drying operation.